

FIG. 1

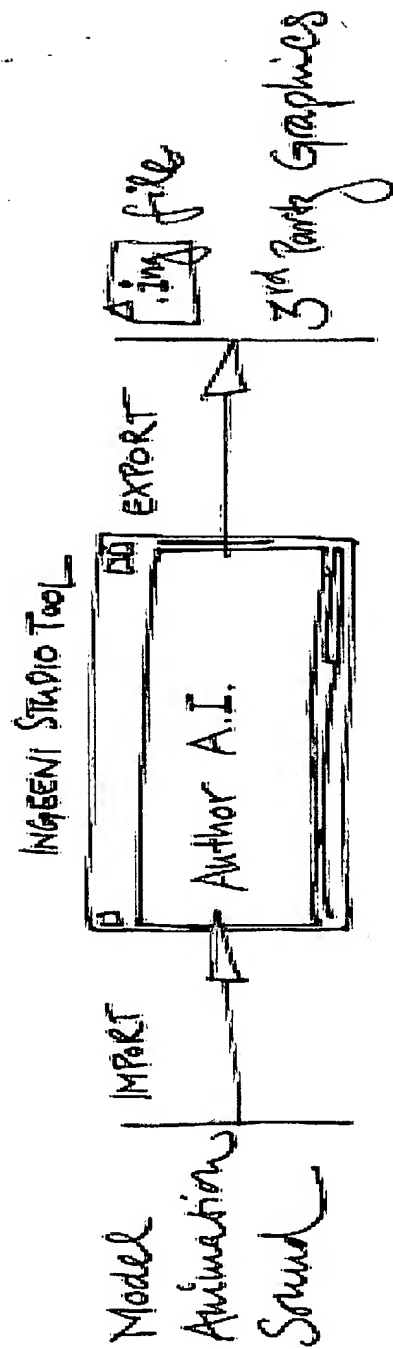


FIG. 2

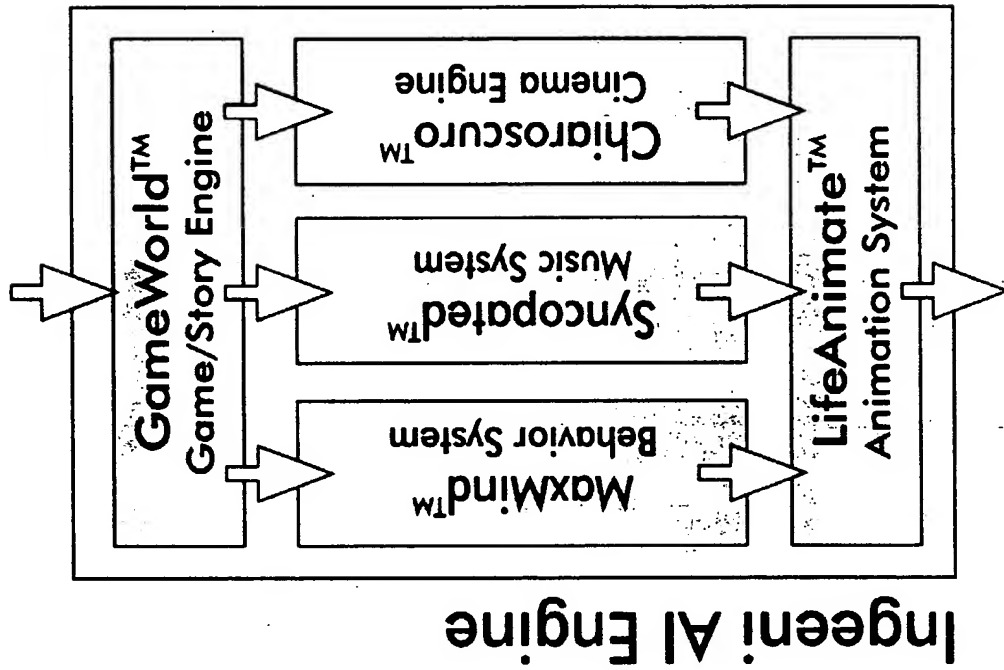


FIG. 3

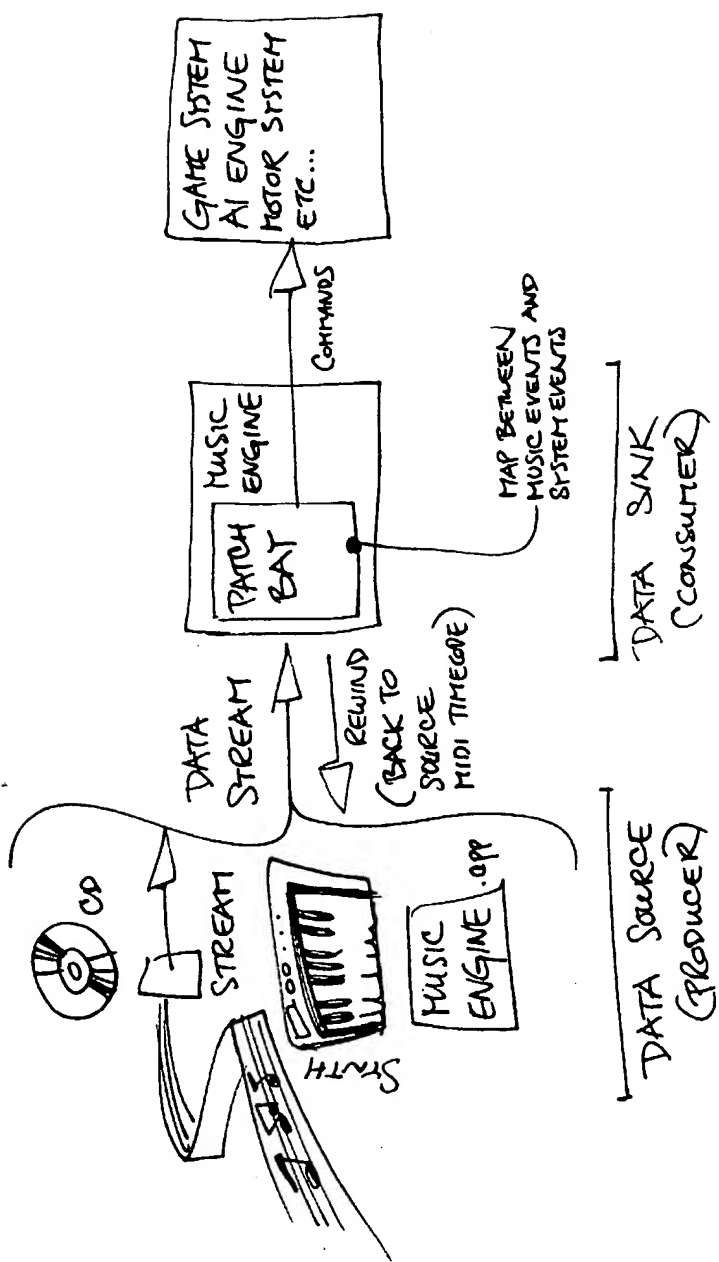


FIG. 4

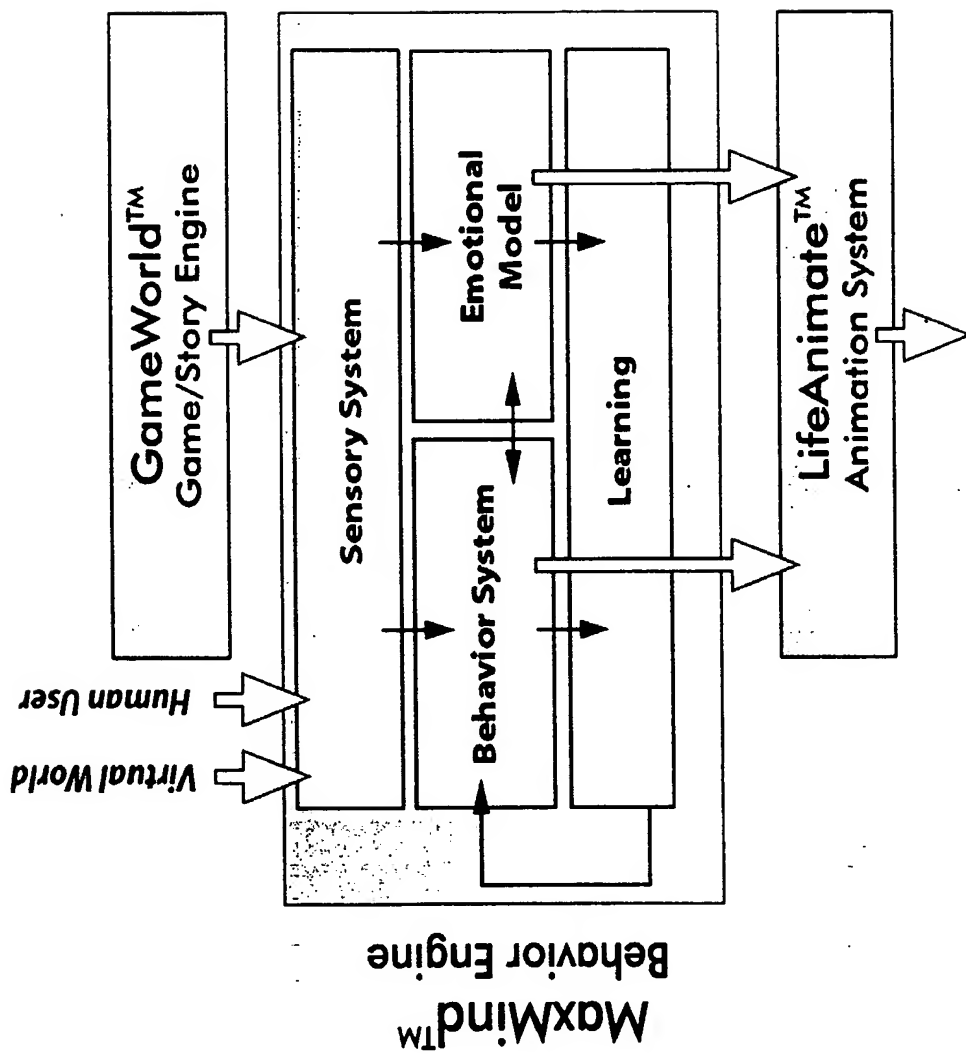


FIG. 5

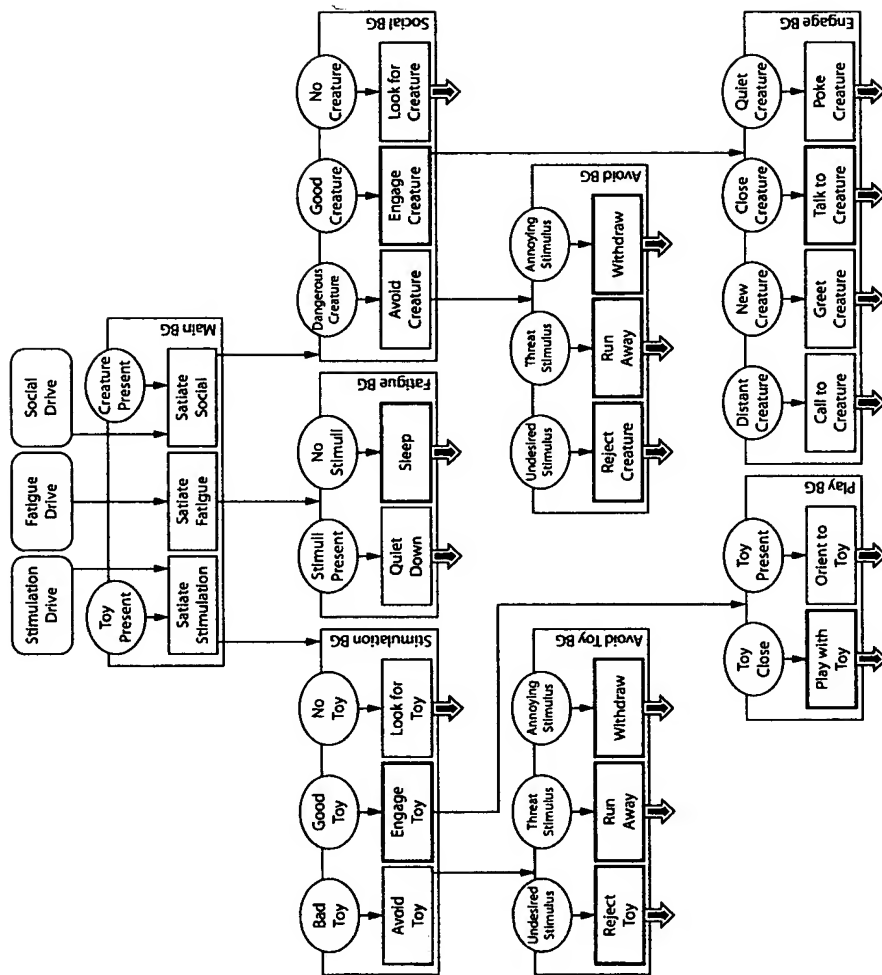


FIG. 6

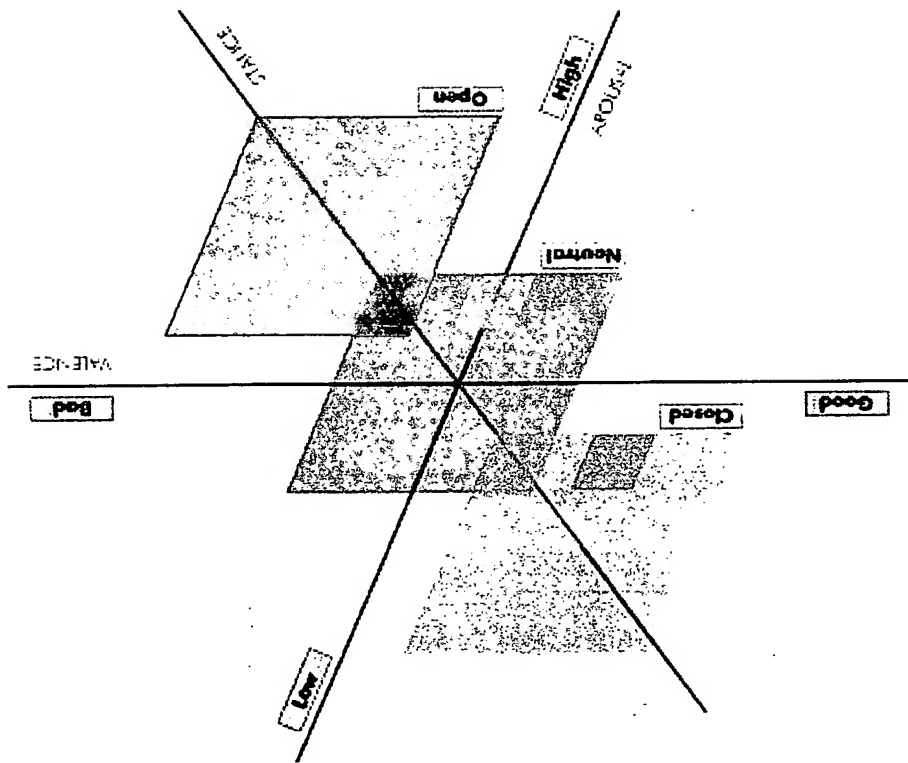
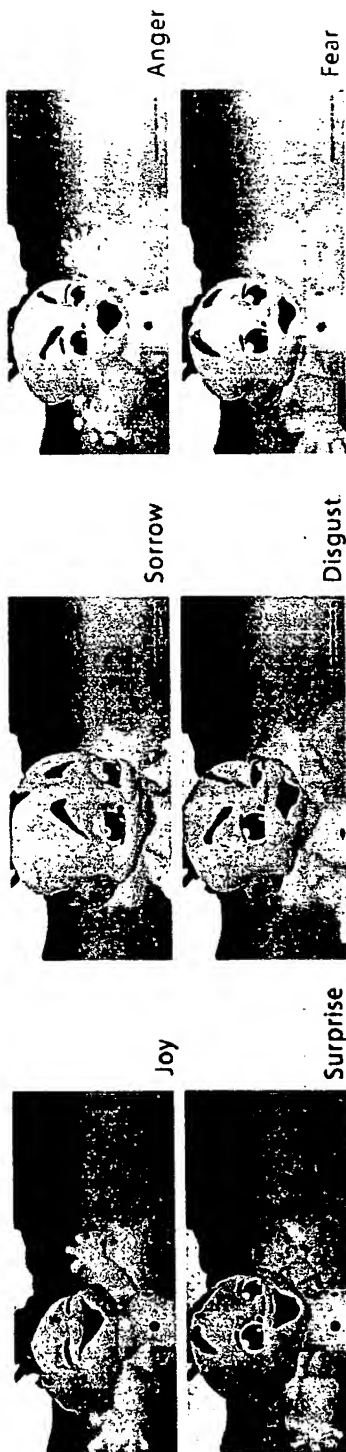


FIG. 7



| Trigger condition | Emotion | Resulting behavior |
|---------------------------------------|----------|-------------------------|
| Difficulty in achieving goal | Anger | Complain |
| Presence of an undesired stimulus | Disgust | Withdraw |
| Threatening, overwhelming stimulus | Fear | Escape |
| Success in achieving goal | Joy | Laugh, display pleasure |
| Prolonged absence of desired stimulus | Sorrow | Display sorrow |
| A sudden stimulus | Surprise | Startle response |

FIG. 8

| Image Composite (existing metaphor) | Animation Composite |
|-------------------------------------|---|
| Pixel | Animation channel, or animation curve, or Degree of Freedom (DOF), or a floating point number changing over time. |
| Layer | An animation, a collection of animation channels over time, a Skill. |
| Transparency | An animation in a layer can be sparse; it does not need to "touch" every channel. Empty animation channels correspond to transparent pixels. |
| Blend mode | Applies to animation data as well, determines the type and percentage contribution of each layer. |

FIG. 10

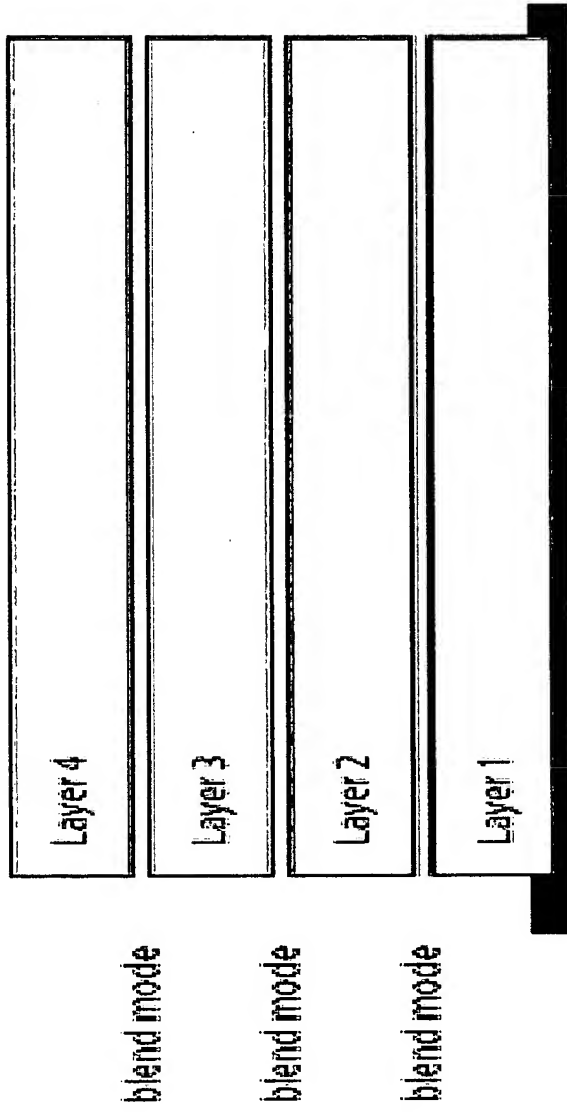


FIG. 11

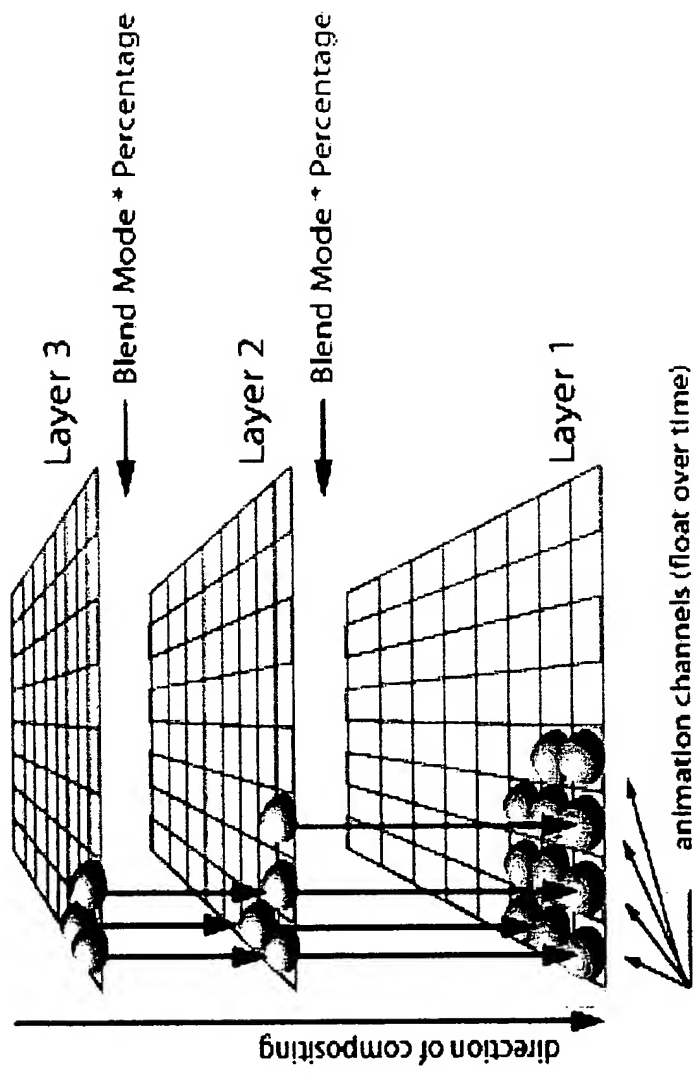


FIG. 12

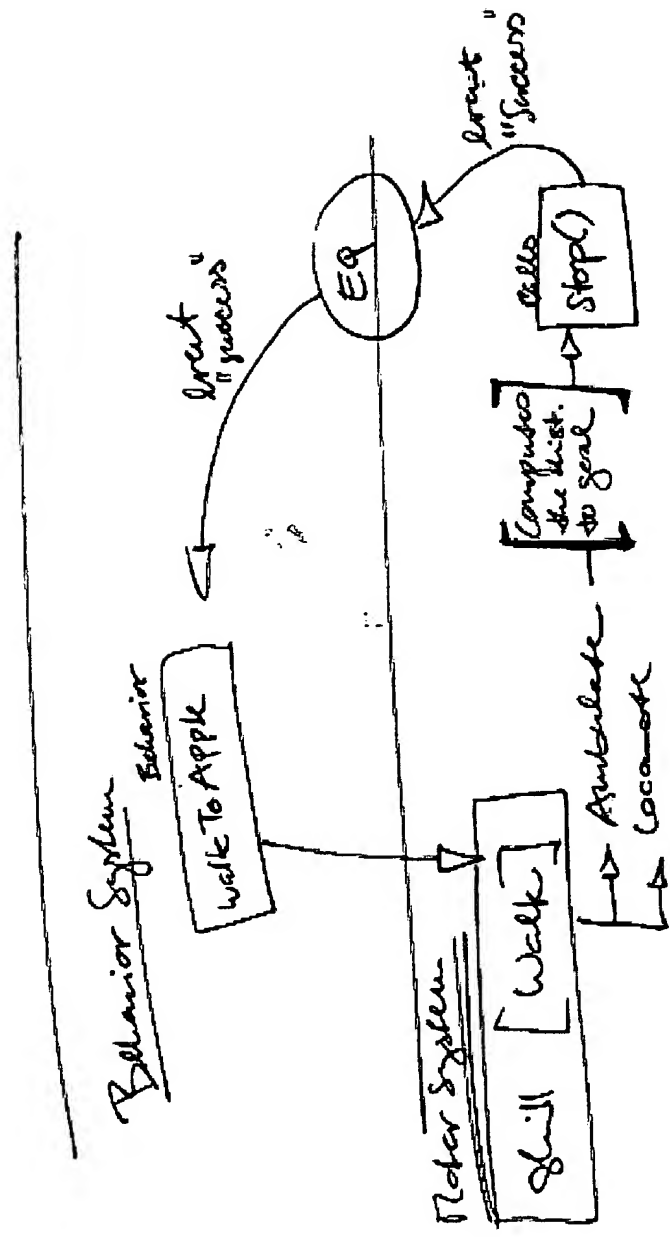


FIG. 13

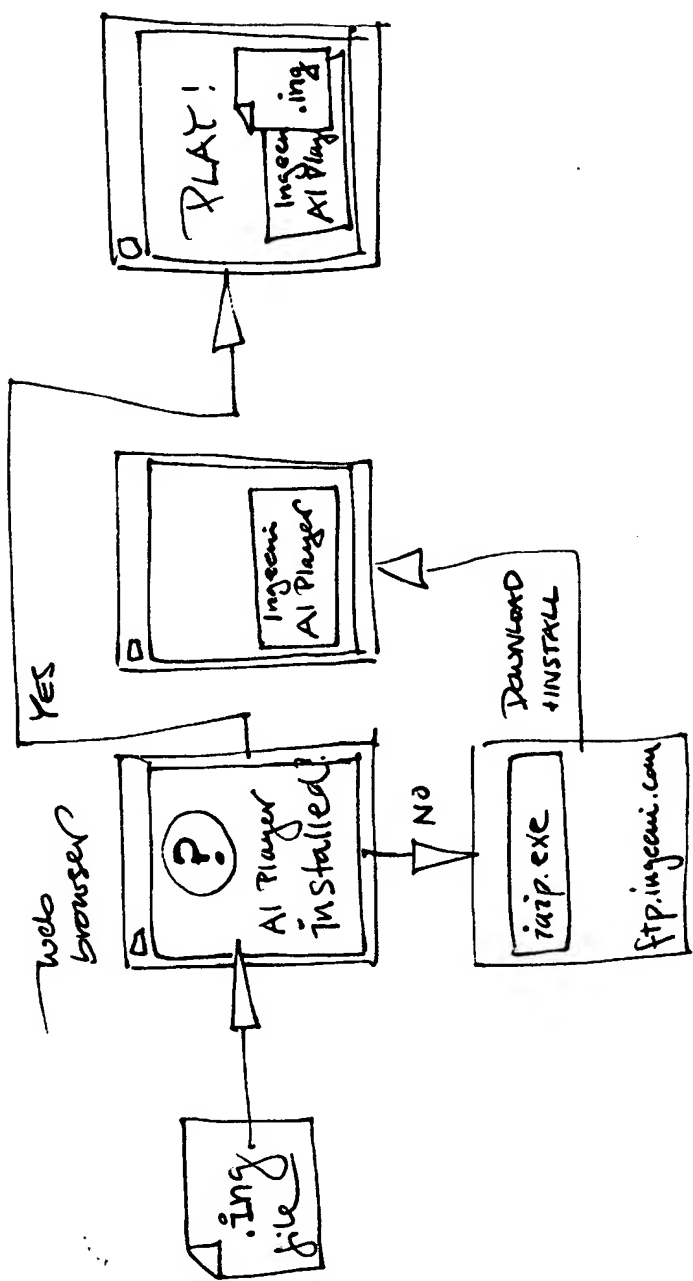


FIG. 14

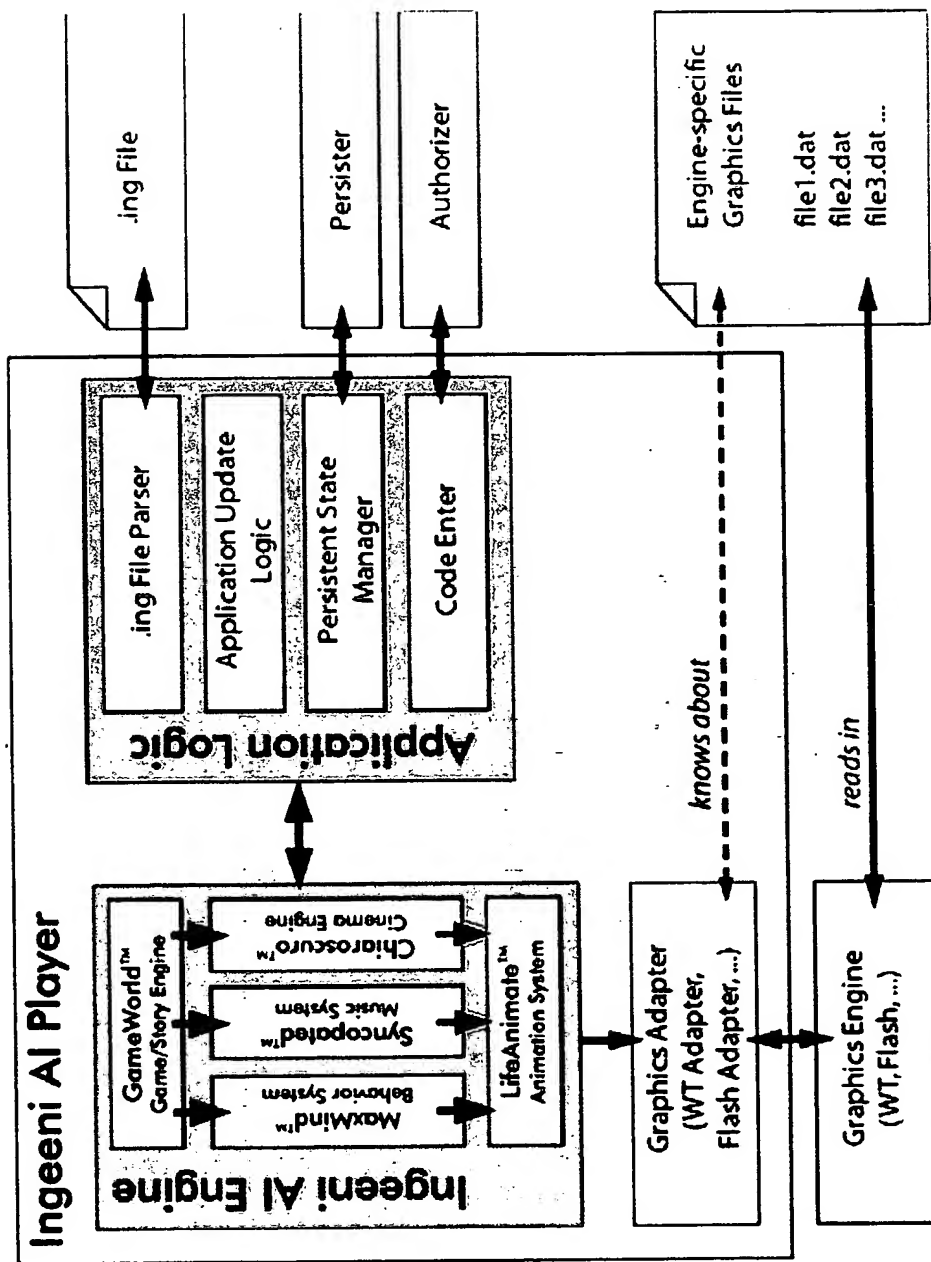


FIG. 15

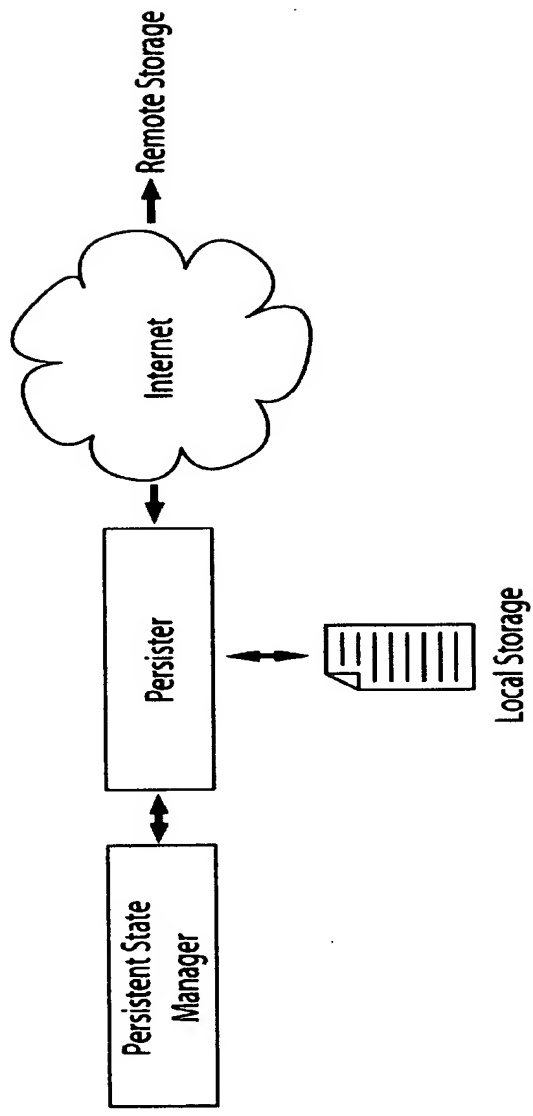


FIG. 16

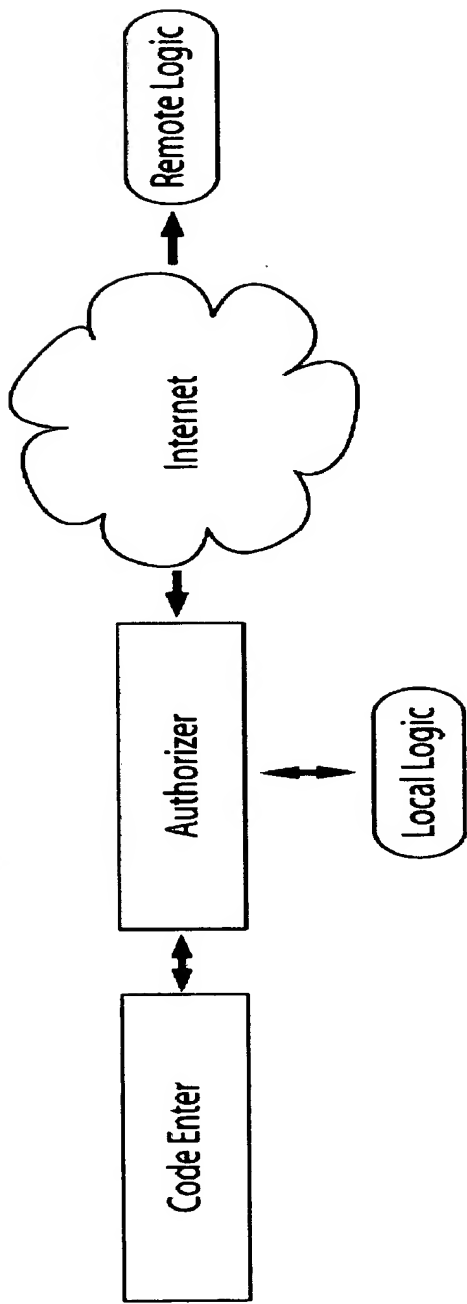


FIG. 17

Ingeeni AI Player

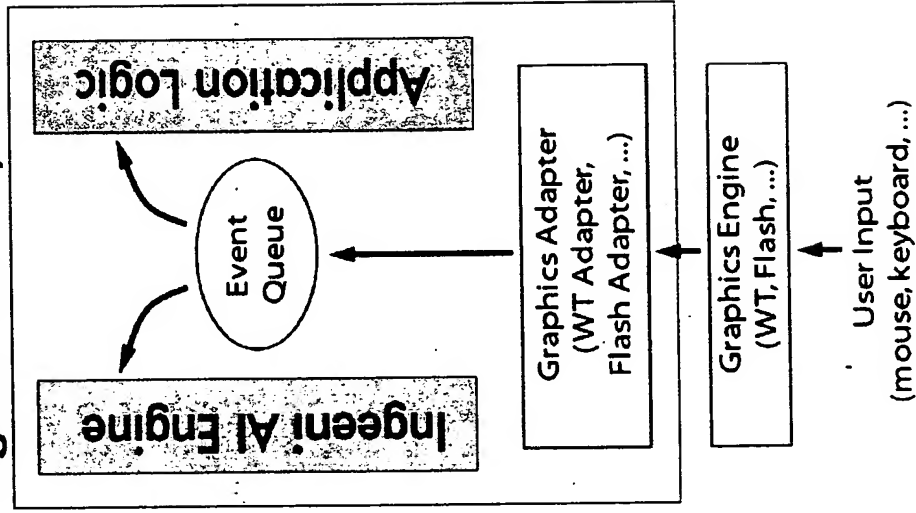


FIG. 18

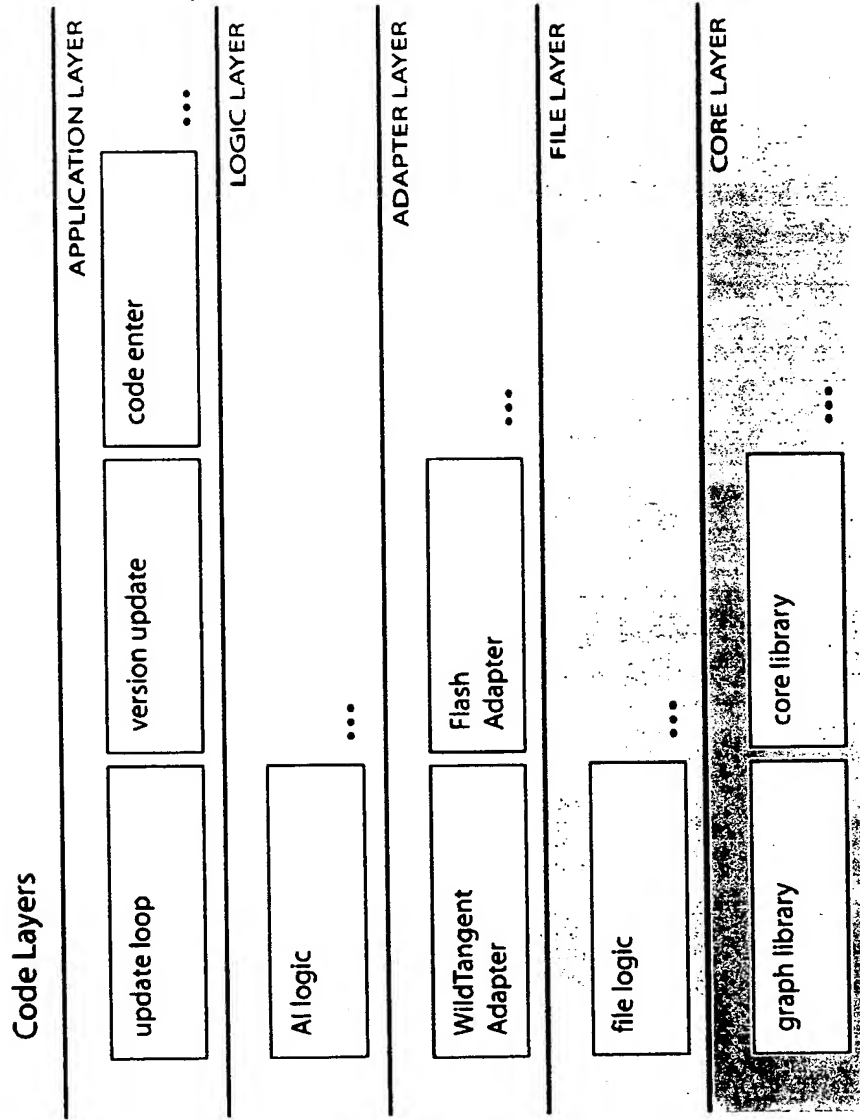


FIG. 19

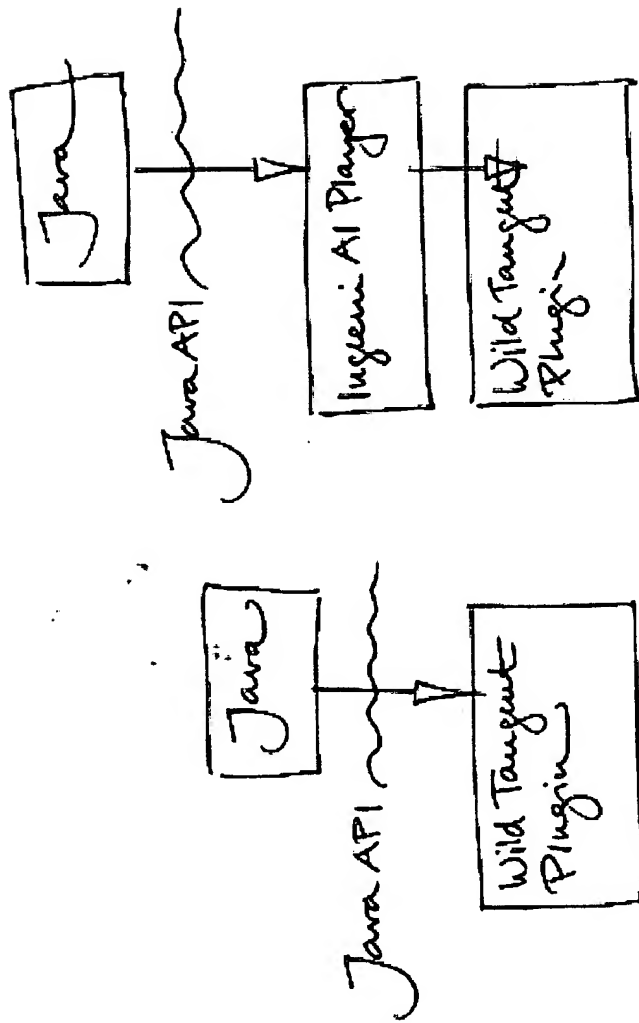


FIG. 20

| Windows | OS X |
|-------------------|-------------------|
| Internet Explorer | Internet Explorer |
| Netscape | Netscape |
| | Safari |

FIG. 21

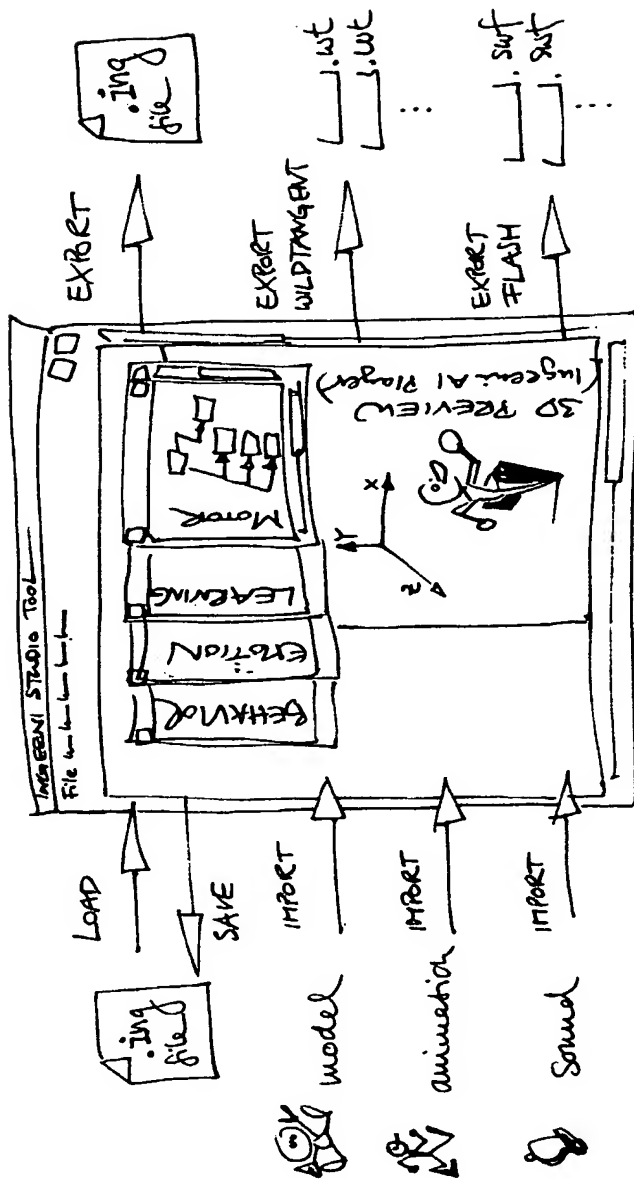


FIG. 22

| <i>Suffix</i> | <i>Name</i> | <i>Owner/3rd Party</i> | <i>Purpose</i> |
|---------------|---------------|-----------------------------------|-----------------------|
| .dxf | DXF | AutoDesk | 3D models |
| .obj | AW Object | Alias Wavefront | 3D models |
| .mb | Maya Binary | Alias Wavefront | 3D models, animations |
| .ma | Maya ASCII | Alias Wavefront | 3D models, animations |
| .max | 3D Studio MAX | Discreet | 3D models, animations |
| .wav | Wave | - | Sound/music |
| .mid | MIDI | - | Sound/music |
| .jpg | JPEG | - | Image |

FIG. 23

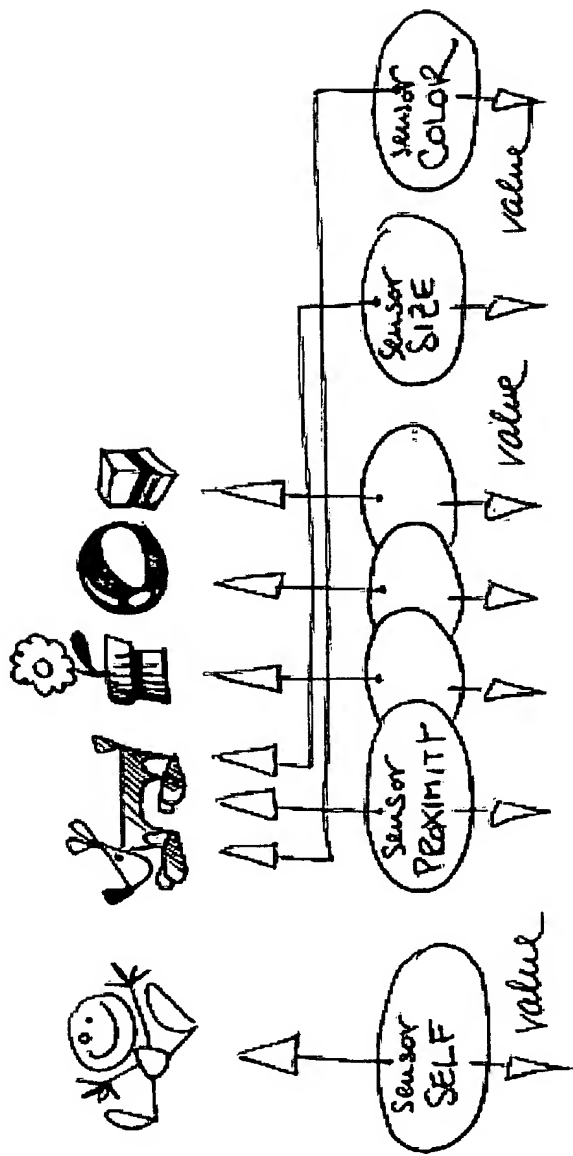


FIG. 24

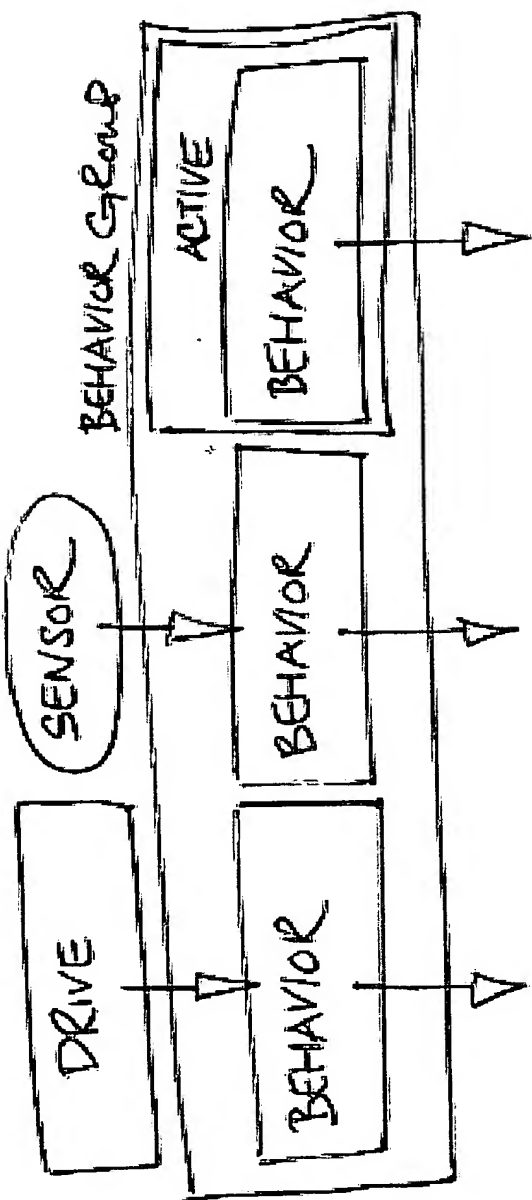


FIG. 25

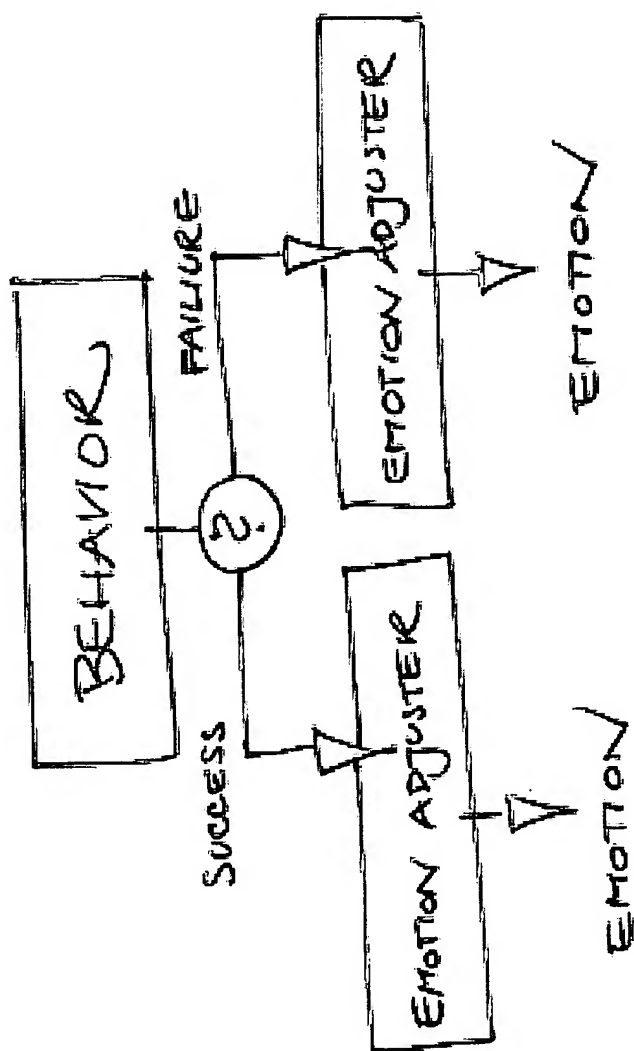


FIG. 26

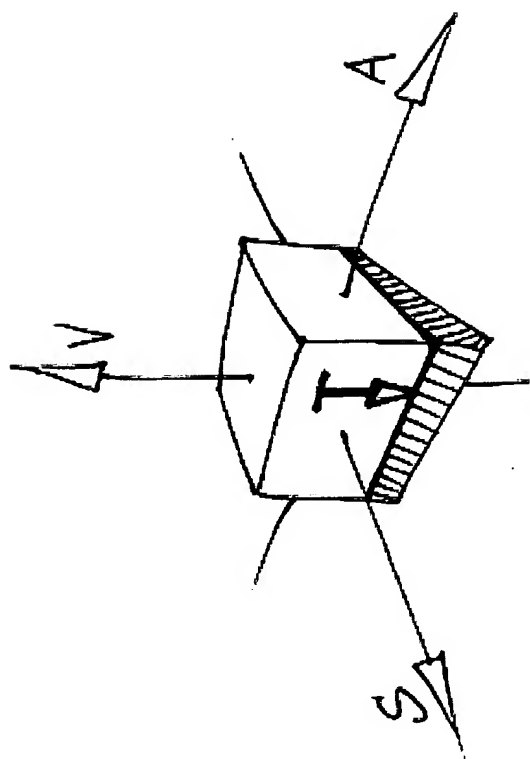


FIG. 27

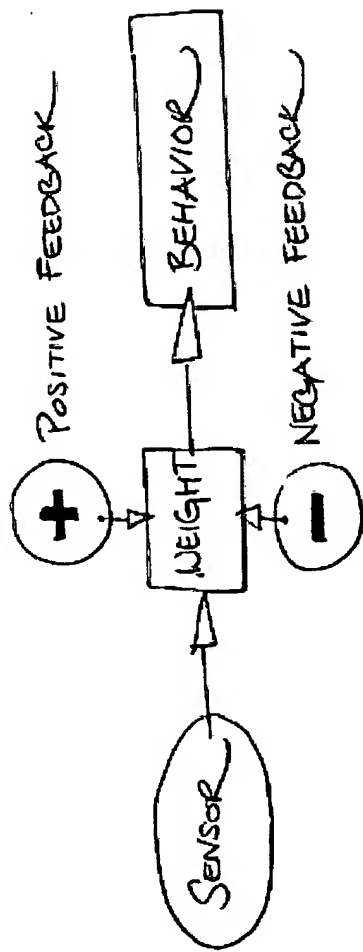


FIG. 28

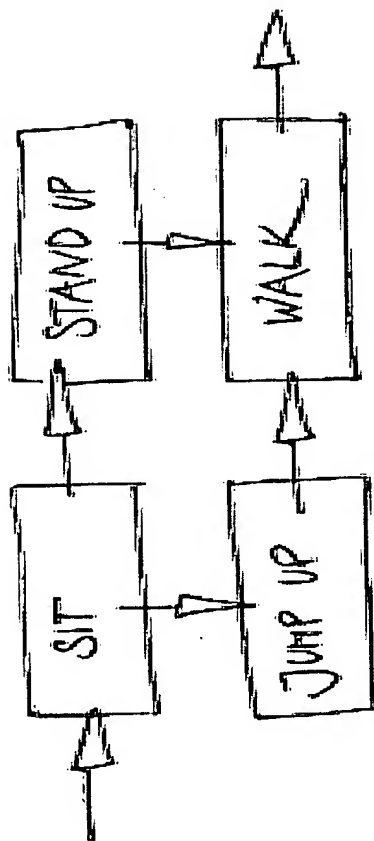


FIG. 29

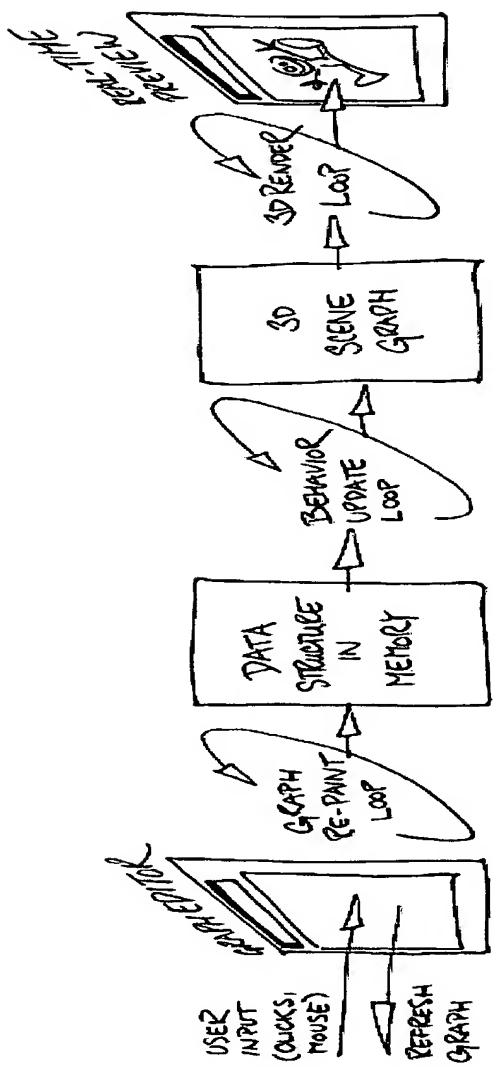


FIG. 30

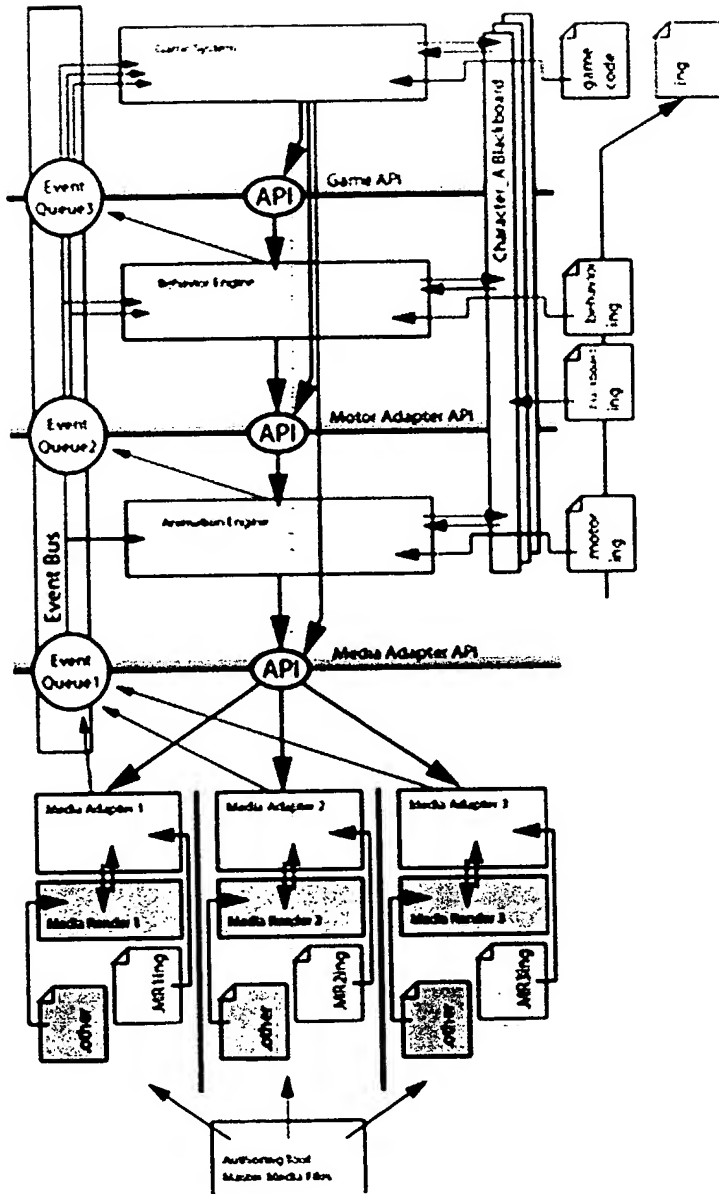


FIG. 31

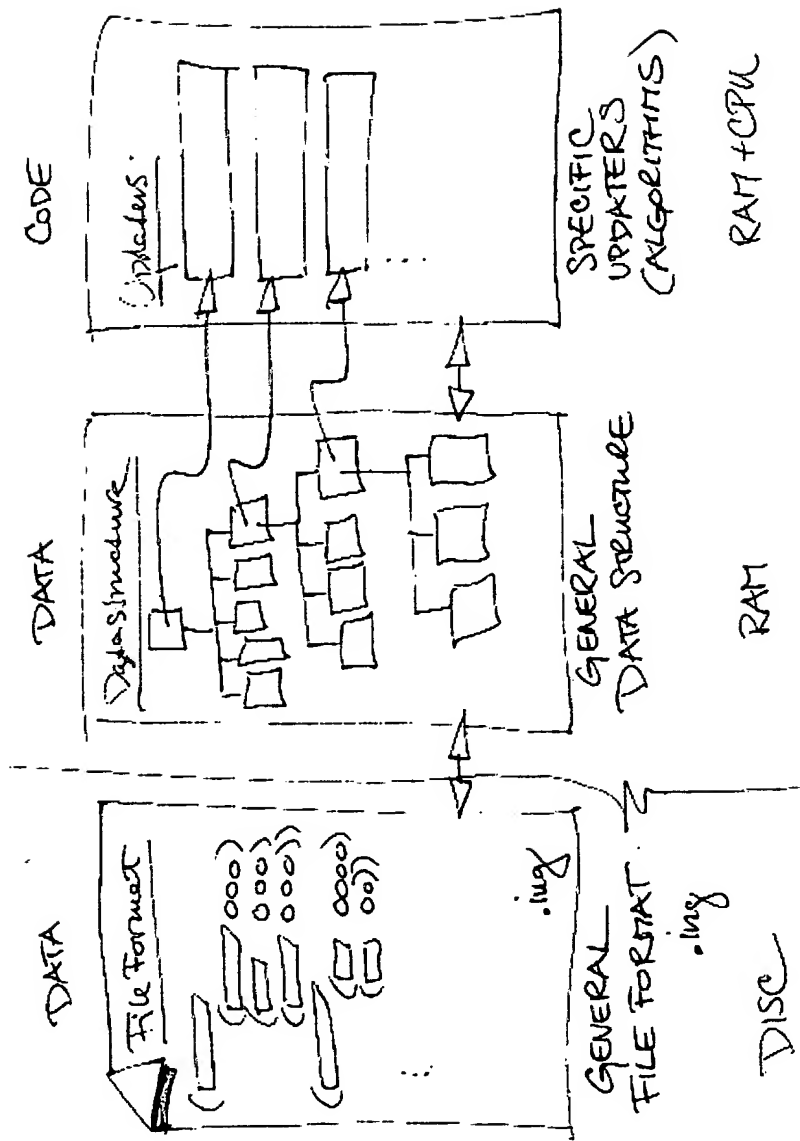


FIG. 32

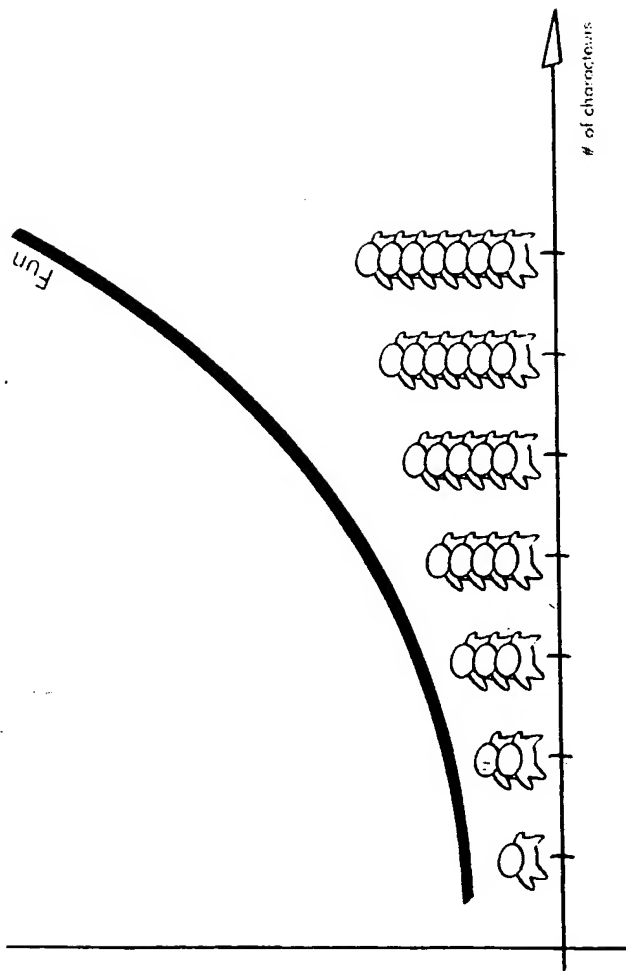


FIG. 33

| | Positive | Negative |
|---------------|--|--|
| Temperament | User interacting in a happy, positive way with the character | User encourages sad or bored behavior in the character |
| Pervasiveness | User's positive interaction with character continues throughout virtual worlds | User's negative interaction with character continues throughout virtual worlds |
| Permanence | The consistency with which the user interacts in a positive way | The consistency with which the user interacts in a negative way |
| Aid | User increases character's level of happiness | User allows and does not stop negative influence of antagonist |
| Nourishment | User feeds a healthy, good, often "branded" food to the character | User feeds a sickly food to the character |

FIG. 34

| Num | Category | Code Module / Library | Functionality | Version |
|-----|----------|------------------------------------|--|---------|
| 1 | Engine | Story Engine | Imposes a top-level story on the open-ended interactions | V2.0 |
| 2 | Engine | Behavior Engine | Implements Sensor, Behavior, Emotion and Learning subsystems | V1.0 |
| 3 | Engine | Music Engine | Plays out emotionally-colored music in response to the user's and characters' actions | V1.0 |
| 4 | Engine | Cinema Engine | Controls the autonomous camera and lighting of the scene | V1.0 |
| 5 | Engine | Animation Engine | Interprets the behavior system commands based on the character's motor skills | V1.0 |
| 6 | Data | AI Graph Data Structure | Holds all behavior, emotion, motor and learning-related data for all characters, world and camera | V1.0 |
| 7 | Data | <i>.inq File Specification</i> | <i>written document (not code)</i> | V1.0 |
| 8 | Data | <i>.inq Parser</i> | <i>read/write functionality for .inq file format</i> | V1.0 |
| 9 | Player | Application Main | Contains the Player main loop | V1.0 |
| 10 | Player | Application Update | Takes care of Versioning of the Player itself, looks for available updates and manages them | V1.0 |
| 11 | Player | Persistent State Manager | Keeps track of the state of the scene as changed by the user, talks to Persister | V1.0 |
| 12 | Player | Code Enter | Allows the user to enter PowerCodes, talks to Authorizer | V1.0 |
| 13 | Player | Graphics Adapter WildTangent | Provides an interface between animation engine and WildTangent graphics | V1.0 |
| 14 | Player | Graphics Adapter 2D | Provides an interface between animation engine and a possible 2D graphics solution | V2.0 |
| 17 | Player | <i>Java API V1.0 Specification</i> | <i>written document (not code)</i> | V2.0 |
| 18 | Player | Java API V1.0 Implementation | Defines an API to accessing the Engine's functionality from Java | V2.0 |
| 15 | External | Persister | A module responsible for exchange between Persistent State Manager and a storage device | V1.0 |
| 16 | External | Authorizer | A module responsible for exchange between Code Enter and a code verifier of choice | V1.0 |
| 18 | Tool | Application Main | Contains the Tool main loop | V2.0 |
| 19 | Tool | <i>.inq Parser</i> | <i>read/write functionality for .inq (redesigned)</i> | V2.0 |
| 20 | Tool | Importer WildTangent | A parser for WildTangent's 3D data files; will have to cooperate directly with the company | V2.0 |
| 21 | Tool | Importer .mb | A parser for Maya proprietary data files; we'll have to cooperate directly with the company | V3.0 |
| 22 | Tool | Importer .max | A parser for 3D Studio MAX proprietary data files; we'll have to cooperate directly with the company | V3.0 |
| 23 | Tool | other Importers | based on the developers' requirements | V3.0+ |
| 24 | Tool | Graph Libraries | General software libraries for creating, manipulating and displaying graph structures | V2.0 |
| 25 | Tool | GUI Sensor | GUI for developing and editing Sensor networks | V2.0 |
| 26 | Tool | GUI Behavior | GUI for developing and editing Behavior networks | V2.0 |
| 27 | Tool | GUI Emotion | GUI for developing and editing Emotion networks | V2.0 |
| 28 | Tool | GUI Learning | GUI for developing and editing Learning networks | V2.0 |
| 29 | Tool | GUI Motor | GUI for developing and editing Motor networks | V2.0 |
| 30 | Tool | 3D Scene Graph | A 3D scene graph for the real-time preview | V2.0 |
| 31 | Tool | 3D Real-Time Graphics | A 3D real-time graphics engine; either licensed 3rd party or developed in-house | V2.0 |
| 32 | Tool | Exporter WildTangent | An exporter for WildTangent's data files; will have to cooperate directly with the company | V2.0 |
| 33 | Tool | Exporter 2D | An exporter for 2D graphics | V3.0+ |

FIG. 35

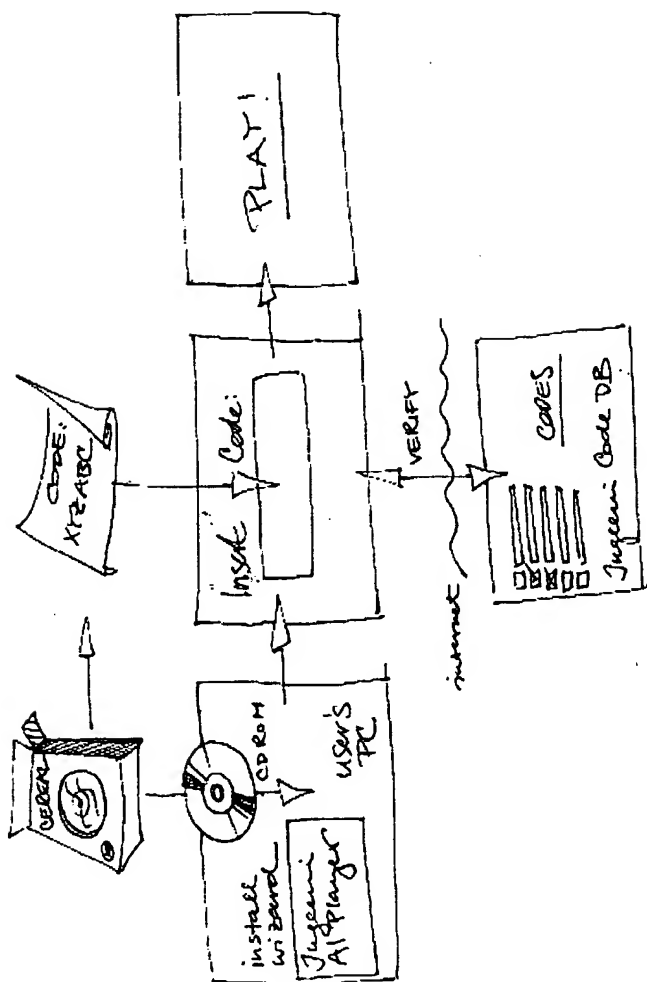


FIG. 36

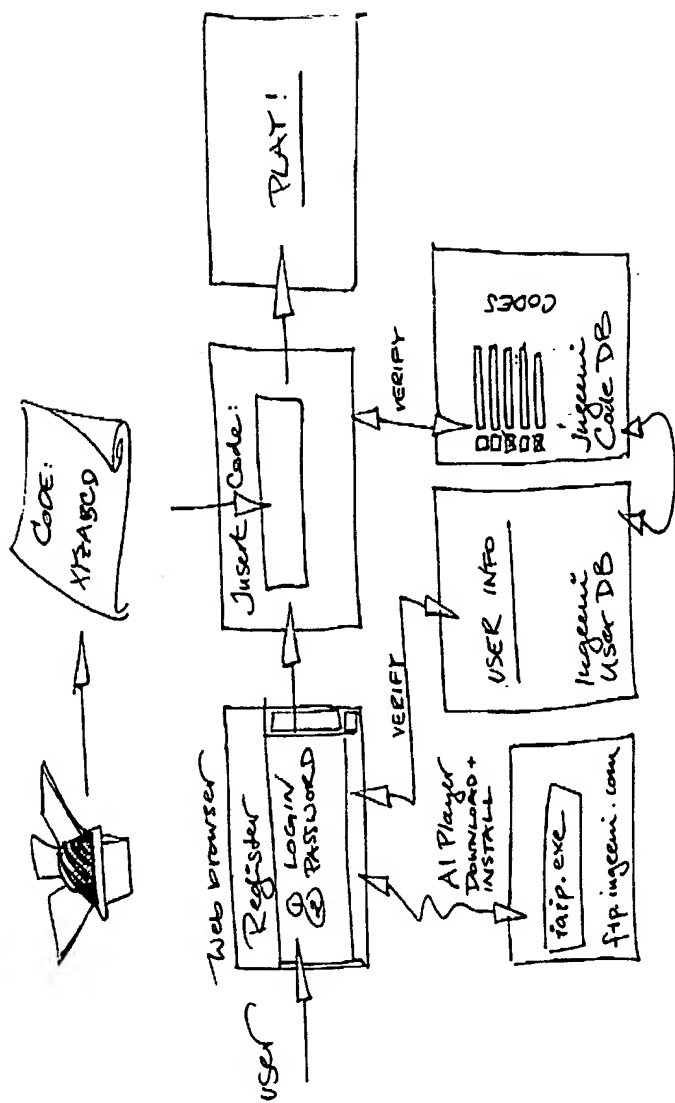


FIG. 37

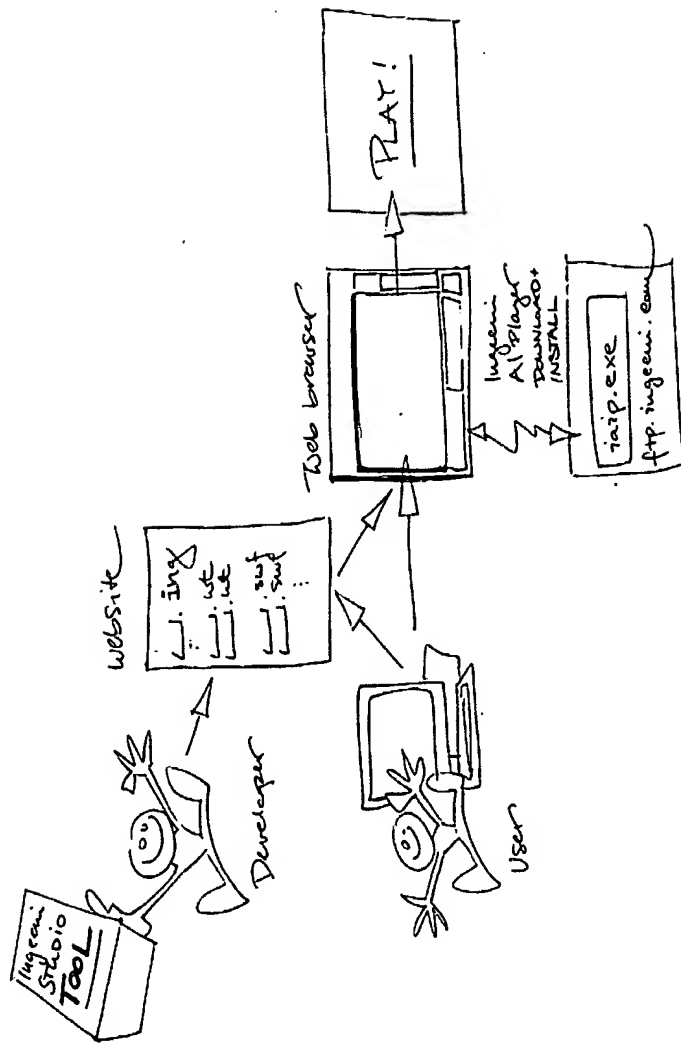


FIG. 38

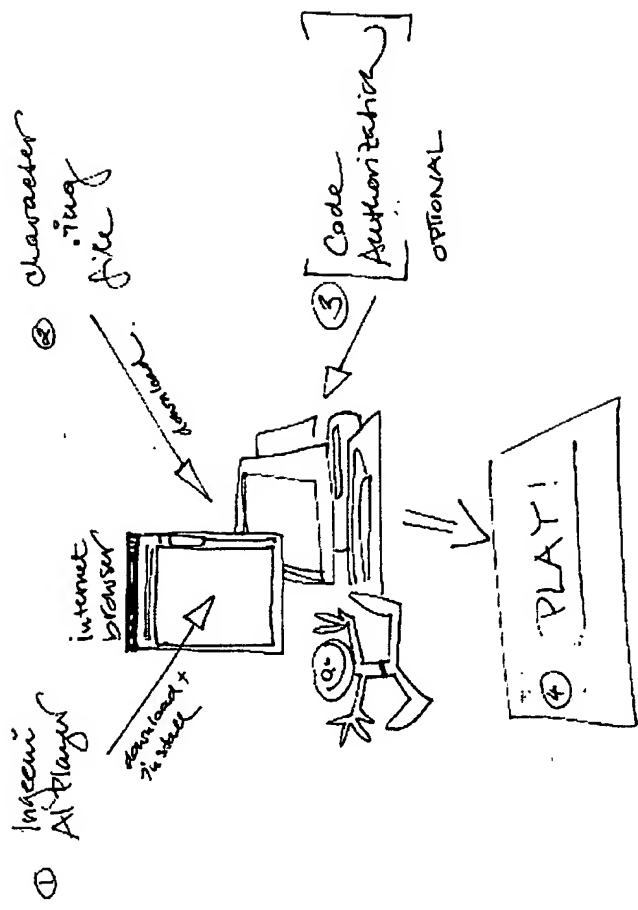


FIG. 39